



Department of Defense
INSTRUCTION

AD-A272 619



March 26, 1991
NUMBER 6055.12

ASD(P&L)

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SUBJECT: DoD Hearing Conservation Program

References:

- (a) DoD Instruction 6055.12, "Department of Defense Hearing Conservation Program," July 6, 1987 (hereby cancelled)
- (b) DoD Directive 1000.3, "Safety and Occupational Health Policy for the Department of Defense," March 29, 1979
- (c) American National Standards Institute (ANSI) Standard S3.20-1973 (R1986), "Psychoacoustical Terminology," December 5, 1973
- (d) DoD Directive 5128.1, "Assistant Secretary of Defense (Production and Logistics)," February 9, 1990
- (e) through (l), see enclosure 1

A. REISSUANCE AND PURPOSE

This Instruction reissues reference (a); to update policy, responsibilities and procedures for administering a DoD hearing conservation program and amplifies policy set forth in reference (b) on the prevention of occupational illness.

B. APPLICABILITY AND SCOPE

This Instruction:

1. Applies to the Office of the Secretary of Defense (OSD); the Military Departments; the Chairman, Joint Chiefs of Staff and the Joint Staff; the Unified and Specified Commands; the Inspector General of the Department of Defense (IG, DoD); the Uniformed Services University of the Health Sciences (USUHS); the Defense Agencies, and the DoD Field Activities (hereafter referred to collectively as "the DoD Components"). The term "Military Services," as used herein, refers to the Army, the Navy, the Air Force, and the Marine Corps.
2. Applies to all DoD military and civilian (appropriated and nonappropriated) personnel and operations worldwide.

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3. With the exception of requirements for reference and termination audiograms, does not apply to personnel defined as deaf in ANSI Standard S3.20-1973 (R1986) (reference (c)).

C. DEFINITIONS

Terms used in this Instruction are defined in enclosure 2.

D. POLICY

It is DoD policy to protect all DoD personnel from hearing loss resulting from occupational noise exposure through a continuing, effective, and comprehensive hearing conservation program.

E. RESPONSIBILITIES

1. The Assistant Secretary of Defense (Production and Logistics) (ASD(P&L)), consistent with DoD Directive 5128.1 (reference (d)), shall:

a. Provide policy guidance and coordination on hearing conservation matters within the Department of Defense.

b. Serve as the principal DoD point of contact (POC) with Federal and State regulatory agencies that control occupational exposure to hazardous noise.

2. The Heads of the DoD Components that conduct operations involving occupational exposure to hazardous noise shall establish and maintain hearing conservation programs to implement this Instruction. Such programs shall encompass the minimum requirements set forth in section F and shall include provisions to periodically evaluate the effectiveness of their hearing conservation programs.

F. PROCEDURES

1. Written plan Each DoD Component shall prepare a written plan for the implementation of a comprehensive hearing conservation program. Such plans shall address occupational noise exposure, monitoring, audiometric testing requirements, hearing protectors, information and training, recordkeeping, noise exposure computation, methods for estimating the adequacy of hearing protector attenuation, audiometric measuring instruments, audiometric test rooms, and acoustic calibration of audiometers.

2. Program implementation Hearing conservation programs shall be implemented, when personnel are exposed to the following:

a. Steady noise that has an 8-hour time-weighted average (TWA) noise level of 85 A-weighted decibels (dBA) or above. When

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appropriate, implementation may also be started regardless of the duration of noise exposure to 85 dBA, or greater. Those criteria apply only to energy in the audible range, up to 16,000 Hertz (Hz).

b. Impulse noise of 140 peak decibels (dB_P), or greater.

3. Noise measurements and analysis

a. Sound pressure levels shall be measured in all potentially noise-hazardous work areas at least once and within 30 days of any change in operations effecting noise levels.

b. A TWA noise level shall be established for all DoD civilian employees working in noise-hazardous areas and military personnel working in noise-hazardous industrial type operations at least once and within 30 days of any change in operations effecting noise levels.

c. A risk assessment code (RAC) shall be assigned to all noise-hazardous areas and operations, in accordance with DoD Instruction, 6055.1 (reference (e)).

d. A current inventory of all noise-hazardous areas and operations shall be maintained to include, minimally, TWAs, RACs, names of personnel at risk, and the types of control measures used.

e. Only personnel who meet training requirements specified by the DoD Components shall conduct noise surveys.

f. Instrumentation used for those surveys must meet or exceed requirements in ANSI Standard S1.4-1983 (reference (f)). Those instruments must be calibrated and the calibration checked with an acoustical calibrator, accurate to within plus or minus 1 decibel (dB), before and after each day's measurements and must have been subjected to a complete electro-acoustical calibration no more than 1 year before the survey.

g. Minimally, steady noise measurements shall be made using "A" weighting, with the meter response set to "slow."

(1) When personal noise dosimeters are used for worker exposure measurements, they must integrate all sound levels from 80 dB to 130 dB using a minimum of the OSHA 5 dB exchange rate. Components may use more stringent criteria, i.e. integration of a broader range or exchange rates less than 5 dB.

(2) Area monitoring may be used to determine worker exposure. In circumstances such as high worker mobility, significant variations in noise levels, or a significant component of impulse noise, representative personal sampling shall be conducted.

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h. Worker noise exposure shall be computed, in accordance with enclosure 3, without regard to any attenuation provided by hearing protectors.

i. Impulse noise measurements should be made using calibrated sound level meters that meet or exceed specifications in ANSI Standard S1.4-1983 (reference (f)), have a peak hold circuit and have a rise time not exceeding 35 microseconds and are capable of measuring peak sound pressure levels in excess of 140 dB.

j. If sound level meters meeting the requirements of paragraph F.3.i., above, are not available, a combination of calibrated instruments having a peak hold circuit and with a rise time not exceeding 35 microseconds and capable of measuring peak sound pressure levels in excess of 140 dB may be used for impulse noise measurements.

4. Safety signs and labels

a. All hazardous noise areas must be clearly identified by signs located at their entrances or boundaries.

b. Each tool or piece of equipment producing hazardous noise shall be conspicuously marked to alert personnel, except when an entire space is designated a hazardous noise area, and the equipment is stationary. Exteriors of military combatant equipment are excluded from this requirement. Professional judgment and discretion should be exercised when labeling tools and equipment.

c. Signs and decals that describe (verbally or with other visual symbols) the hazard and the protective measures to be taken shall be used to designate hazardous noise areas and equipment; e.g., "DANGER," "Hazardous Noise," "Hearing Protection Required When in Operation."

5. Noise abatement

a. Engineering controls shall be the primary means of reducing or eliminating personnel exposure to hazardous noise. All practical design approaches to reduce noise levels below hazardous levels by engineering principles shall be explored. Priorities for noise control resources shall be assigned based on the applicable RAC. Where engineering controls are undertaken, the design objective will be to reduce steady-state levels to below 85 dBA without regard to time and to reduce impulse noise levels to below 140 dBp. Engineering controls shall be applied to military-unique workplaces, as defined in DoD Instruction 6055.1, (reference (e)), within the constraints of maintaining combat readiness.

b. New equipment being considered for purchase shall have the lowest noise emission levels that are technologically and economically

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feasible and compatible with performance and environmental requirements. The provisions of Section 15 of the "Noise Control Act of 1972", Pub. L. 92-574, (reference (g)) applies.

c. Acoustics shall be included in specifications for all new facilities and substantial modification projects, and weapons systems and subsystems (see: MIL-STD-882B, reference (h)). The objective shall be to ensure, if feasible, a steady-state level of 84 dBA, or less, at all personnel locations during normal operation.

6. Personal hearing protectors

a. The use of personal hearing protectors to limit noise exposure is considered to be an interim protective measure, while engineering control methods are being explored. Such devices shall constitute a permanent measure, only if engineering controls are not technologically or operationally feasible.

b. The DoD Components shall issue personal hearing protectors free to all personnel who work in designated hazardous noise areas.

c. The hearing protectors provided must be capable of attenuating worker noise exposure below an 8-hour TWA of 85 dBA. If hearing protectors do not provide sufficient attenuation, administrative control of exposure shall be necessary.

d. Personnel shall be free to choose personal hearing protectors from among those available through Defense Logistics Agency (DLA) supply channels unless medically contraindicated or inappropriate for a particular hazardous noise exposure. Hearing aids and noise muffs with built-in radios that are designed for recreational listening must not be used in place of, or with, approved hearing protectors.

e. Preformed earplugs shall be fitted and issued only under the supervision of personnel who have been specifically trained to fit earplugs.

f. Personnel shall receive adequate and effective training in the proper care and use of personal hearing protectors.

g. Personnel working in or entering designated hazardous noise areas shall carry hearing protectors at all times. When noise sources are operating, personnel shall wear their hearing-protection devices regardless of exposure time. All personnel exposed to gunfire or artillery fire in test or training situations must wear hearing protectors.

h. The DoD Components must assess the adequacy of hearing protectors when used in very high noise environments or for extended exposure periods.

i. All levels of supervision and management, by personal example and precept, shall enforce the use of hearing protectors. Additionally, DoD component programs should stimulate peer pressure to strengthen compliance. For noncompliance, management shall consider disciplinary action as a corrective measure against the offender and the supervisor.

7. Education

All personnel who routinely work in designated hazardous noise areas shall receive annual training on the following:

- a. effects of noise on hearing.
- b. the purpose of hearing-protection
- c. the advantages, disadvantages, and attenuation of various hearing protectors
- d. the purpose of audiometric testing
- e. explanation of the test procedures.

Also, they shall be encouraged to use hearing protectors when they are exposed to hazardous noise during off-duty activities.

8. Audiometric testing

a. All personnel routinely exposed to hazardous noise shall be placed in a hearing testing program. That program shall include preplacement, periodic (at least once, annually), and termination audiograms. Personnel who infrequently or incidentally enter designated hazardous noise areas need not participate in the audiometric testing program.

b. All audiometric testing shall:

(1) Be performed by a licensed or certified audiologist, otolaryngologist, or other physician; or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation or who has completed the equivalent military training. A technician who performs audiometric tests shall be responsible to an audiologist, an otolaryngologist, or a physician.

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(2) Transpire in a testing environment with background octave band pressure levels not greater than the following:

500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
30 dB	30 dB	47 dB	57 dB	62 dB

The test environment shall be resurveyed annually using equipment conforming at least to the Type 2 requirements of ANSI Standard S1.4-1983 and the Order II requirements of ANSI Standard S1.11-1986 (references (f) and (i)).

(3) Include pure tone, air conduction, hearing threshold examinations of each ear at the test frequencies of at least 500, 1000, 2000, 3000, 4000, and 6000 Hz.

(4) Be accomplished with audiometers that meet the specifications of ANSI Standard S3.6-1989 (reference (j)).

(5) Occur on audiometers calibrated per specifications in reference (j).

c. Every effort should be made to conduct a reference audiogram on workers before they are assigned to duties involving hazardous noise exposure. In no case shall a reference audiogram be conducted more than 1 month from the date of a worker's initial exposure to hazardous noise. Regardless of the time of initiation, the first valid hearing test administered is the reference audiogram and shall be preceded by at least 14 hours without exposure to workplace noise. The worker shall be cautioned to avoid high levels of nonoccupational noise exposure during a 14-hour period preceding the examination.

d. Personnel who continue to work in designated hazardous noise areas shall receive annual audiograms.

e. Termination audiogram shall be conducted on each worker about to stop working in designated hazardous noise areas. Personnel moving to other jobs involving hazardous noise exposure need not be given a termination audiogram.

f. When calculating the standard threshold shift, the reference audiogram test results are to be transcribed into the Reference Audiogram spaces of DD Form 2216. The reference values are subtracted from the current values at 1000, 2000, 3000 and 4000 Hz. The shifts at 2000, 3000 and 4000 Hz are added together and divided by three, for each ear. These results will be recorded on the DD Form 2216 above the audiogram results next to the word "Left" for the left ear and next to the word "Right" for the right ear.

g. Follow up audiograms shall be conducted when an individual's audiogram shows a threshold shift relative to the original or revised reference audiogram of an average of 10 dB, or more, at 2000, 3000, and 4000 Hz in either ear. The National Institute for Occupational Safety and Health (NIOSH) age corrections may be applied in cases of positive threshold shift (29 CFR 1910.95) (reference (k)). Medical evaluation is required to validate the existence of a permanent noise-induced threshold shift and shall be done by an audiologist, otolaryngologist, or physician. Any determination that the noise-induced threshold shift is not work-related or has not been aggravated by occupational noise exposure shall be made by a physician.

h. If the threshold shift is confirmed as permanent, the individual shall be notified in writing within 21 days of such determination, and the condition entered in the individual's medical record. The individual shall be refitted with hearing protection, instructed in its care and use, and strongly encouraged to wear the hearing protection.

i. A new reference audiogram shall replace the original reference audiogram, when the medical evaluation confirms the threshold shift noted during the annual audiogram is permanent. The original reference audiogram shall be retained in the patient's medical record on a DD Form 2215, Reference Audiogram. A revised reference audiogram should also be established, when the hearing threshold demonstrated in the annual audiogram indicates significant improvement over the existing reference audiogram.

9. Personnel assignments

a. The DoD Components may require personnel under consideration for entry-level DoD service (either civilian or military duty), in an occupational specialty that involves routine exposure to hazardous noise, to meet minimum preselection hearing-level criteria. The DoD Components may develop minimum preselection hearing-level criteria and designate applicable occupational specialties.

b. The DoD Components may establish criteria for permanently excluding personnel with a substantial hearing loss from working in hazardous noise environments. Any exclusion criteria must be applied judiciously to ensure that qualified, trained personnel are not indiscriminately excluded from their career field. Excluding a worker from a career field should be the last resort after repeated attempts to protect the individual's hearing have failed.

10. Access to information, training material, and records

a. The DoD Components shall make available to personnel copies of the DoD Component directives issued on the DoD Hearing

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Conservation Program. In addition, the Occupational Health and Safety Administration (OSHA) standard (29 CFR 1910.95) (reference (k)), shall be posted in all industrial noise-hazardous areas.

b. On request, the DoD Components shall provide affected personnel with any information type materials on the DoD Component hearing conservation program that are supplied to the DoD Component by the Assistant Secretary of Labor for Occupational Safety and Health.

c. On request, the DoD Components shall provide personnel, former personnel and representatives designated in writing by the individual civilian employees, with copies of all records pertaining to the audiometric testing and noise exposure to the specific worker.

d. On request, the DoD Components shall provide representatives of the Assistant Secretary of Labor for Occupational Safety and Health with all records pertaining to the DoD Component's hearing conservation program.

11. Records

a. All audiometric testing data shall be maintained for the duration of employment plus 30 years.

b. Results of hearing tests performed for hearing conservation, as well as exposure documentation, shall be a permanent part of an individual's health record. All hearing tests shall be recorded on DD Form 2215, "Reference Audiogram," or DD Form 2216, "Hearing Conservation Data," as appropriate.

c. Noise exposure data shall be kept for a minimum of 30 years and recorded on DD Form 2214, "Noise Survey" or in the equivalent format of automated measurement equipment or health hazard inventory system that contains at least the mandatory data elements.

d. All personnel who routinely work in designated hazardous noise areas shall be identified, and a current roster maintained.

e. Each DoD Component shall maintain a hearing conservation data base for assessing the effectiveness of its hearing conservation program.

f. The following DD forms or computer-generated facsimiles shall be used in the appropriate elements of each DoD Component's program:

(1) DD Form 2214.

(2) DD Form 2214C, "Noise Survey (Continuation Sheet)."

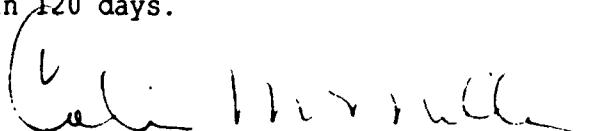
- (3) DD Form 2215.
- (4) DD Form 2216.
- (5) DD Form 2217, "Biological Audiometer Calibration Check."

G. INFORMATION REQUIREMENTS

The recordkeeping requirements of this Instruction are exempt from licensing in accordance with Paragraph E.4.b. of DoD 7750.5-M, "Procedures for Management of Information Requirements" (reference (1)).

H. EFFECTIVE DATE AND IMPLEMENTATION

This Instruction is effective immediately. Forward one copy of implementing instructions to the Assistant Secretary of Defense (Production and Logistics) within 120 days.



COLIN McMILLAN
Assistant Secretary of Defense
(Production and Logistics)

Enclosures - 3

1. References
2. Definitions
3. Noise Exposure Computation

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REFERENCES, continued

- (e) DoD Instruction 6055.1, "DoD Occupational Safety and Health Program," October 26, 1984
- (f) American National Standards Institute (ANSI) Standard S1.4-1983, "Specifications for Sound Level Meters," June 25, 1985.
- (g) Public Law 92-574, "Noise Control Act of 1972," October 1972
- (h) MIL-STD-882B, "System Safety Program Requirements," March 30, 1984
- (i) American National Standards Institute (ANSI) Standards S1.11-1986, "Specifications for Octave-Band and Fractional Octave-Band Analog and Digital Filters," July 16, 1986
- (j) American National Standards Institute (ANSI) Standards S3.6-1989, "Specifications for Audiometers," May 23, 1989
- (k) Title 29, Code of Federal Regulations (CFR), Section 1910.95, "Occupational Noise Exposure," current edition
- (l) DoD Directive 7750.5-M, "Procedures for Management of Information Requirements," November 1986

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DEFINITIONS

1. Decibel A-weighted (dBA). The standard abbreviation for sound levels measured with an instrument set to the A-weighting network. The A-weighting network reduces the contribution of lower frequencies, which are of less concern for hearing conservation.
2. Decibel (dB). A unit of measurement of sound pressure level. The sound pressure level, in dB, is equal to 20 times the common logarithm of the ratio of the existing sound pressure to a reference sound pressure of 20 micropascals.
3. Decibel Peak (dBP). Standard abbreviation for peak sound level equal to 20 times the common logarithm of the ratio of the highest instantaneous sound pressure to a reference pressure of 20 micropascals. Used in the measurement of impulse noise.
4. Hazardous Noise. Exposure to steady state noise equivalent to 85 dBA for 8 hours. Components may define time-intensity trading rates as appropriate for their rest cycle conditions using subsection A.1. of enclosure 3. Exposure to impulse noise levels greater than 140 dB.
5. Hazardous Noise Area. Any work area where workers are likely to receive a daily total noise dose in excess of that calculated using subsection B., enclosure 3, or where impulse noise levels exceed 140 dB. For personnel exposed to appreciable noise levels for periods of 24 hours or more, a daily dose of 100 percent can occur at continuous noise levels as low as 79 dBA.
6. Hertz (Hz). A unit of measure of frequency, numerically equal to cycles per second.
7. Impulse Noise. A short burst of an acoustic energy consisting of either a single impulse or a series of impulses. The pressure-time history of a single impulse includes a rapid rise to a peak pressure, followed by a somewhat slower decay of the pressure envelope to ambient pressure, both occurring within 1 second. When the intervals between impulses are less than 500 milliseconds, the noise is considered continuous, excepting short bursts of automatic weapons fire, which are considered impulse noise.
8. Presbycusis. Hearing loss due to age.
9. Reference Audiogram. An audiogram free from auditory fatigue and other transient otologic pathology, against which future audiograms are compared.
10. Significant Threshold Shift (STS). The STS is the same as the OSHA standard threshold shift. A STS is present when there is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear.

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SAMPLE NOISE EXPOSURE COMPUTATION

A. When using a 4 dB power doubling rate, noise dose may be computed from sound pressure level measurements as follows:

1. When the sound level is constant over the entire workshift, the noise dose, D, in percent, is given by:

$$D = 100 C/T$$

where C is the total length of the workday, in hours, and T is the reference duration corresponding to the measured sound level, L, as computed by the equation:

$$T = 16/(2 \exp(L-81)/4)$$

2. When the workshift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the workday is given by:

$$D = 100(C_1/T_1 + C_2/T_2 \dots C_n/T_n)$$

where C_n indicates the total time of exposure at a specific noise level, and T_n indicates the reference duration for that level as given by the equation:

$$T_n = 16/(2 \exp(L-81)/4)$$

B. The TWA may be computed from noise dosimeter readings as follows. The noise dosimeter should be capable of integrating all noise levels from 80-130 dBA and using a 5 dB time-intensity integration factor or Component exchange rate:

$$TWA = 85 + Q \log(D/100)$$

where TWA is the 8-hour time-weighted average sound level; Q is a constant equal to $R/\log 2$; R is the exchange rate per doubling time (not more than 5 dB); and D is the accumulated dose in percent exposure.

C. When exposures to steady-state noise, including impulse noise below 130 dB_P, occur simultaneously with or within the same 24-hour period as exposure to impulse noise above 130 dB_P, the hazard criteria shall be applied to separately (i.e., the allowable exposure to steady-state noise shall not be reduced because of exposure to impulse noise).